

To: Dennis Osborn, City of Everett Planning

From: Dimitri Siaterlis, PE & Marilee Klimek, LC

Subject: NORTON TERMINAL DEVELOPMENT & MTCA 3RD INTERIM ACTION
LIGHTING MEMORANDUM ASSOCIATED WITH PUBLIC WORKS PERMIT #PW2105-051

Date: June 25, 2021

Cc: Laura Gurley, Port of Everett & Nathan Watson, KPFF Consulting Engineers
Sabrina Fandler, City of Everett, Public Works

The Port recently submitted our Norton Terminal Development & MTCA 3rd Interim Action project for Public Works review (Permit #PW2105-051) and is working with the Planning Department on Land Use requirements. This memorandum is meant to supplement that submittal and address the Code requirements under **EMC 19.12.210.D** for lighting for this proposed terminal cargo yard, that will be redeveloped at the former Kimberly-Clark site. Based on the code language, this proposal meets the intent of being integral to the design of the site, increasing night time visibility and reducing illumination of the sky, reducing horizontal glare and vertical light trespass onto adjacent parcels and using lighting to increase safety and security on site.

The lighting system for this Port cargo yard development is designed to meet Illuminating Engineering Society of North America (IES) **RP-7-17 Industrial Facilities Storage Yard** requirements of lighting levels of 5-foot candle average. This is a commonly used design criteria for these types of facilities. The lighting system consists of fourteen (14) 75-foot-tall high mast light poles, with two (2) 33.5 foot-tall light poles, one each at the north and south gates of the proposed terminal. We have attached a representative photometric site illumination calculation that depicts the light levels we anticipate from the proposed lighting system during **Nighttime Operations** (see **Figure 1**). We have worked to maximize the portions of the proposed terminal that meet the IES requirements for worker safety, while minimizing light spill-over outside of our terminal boundary. As you can see from **Figure 1**, our proposed lighting plan results in minimal spill-over that is limited to the adjacent BNSF railroad and West Marine View Drive (SR529). The existing lighting from the SR529 roadway spills significantly more light onto adjacent residential parcels and will overpower any minor illumination contribution shown on the attached calculations (for reference, 0.01 fc is equivalent to moonlight) from the proposed terminal. Across most of the length of the site's eastern boundary, there is a significant topographic difference between the proposed terminal and West Marine View Drive, which further minimizes light impacts to properties east of West Marine View Drive as shown by the residential property line labeled on the 2nd page of **Figure 1**.

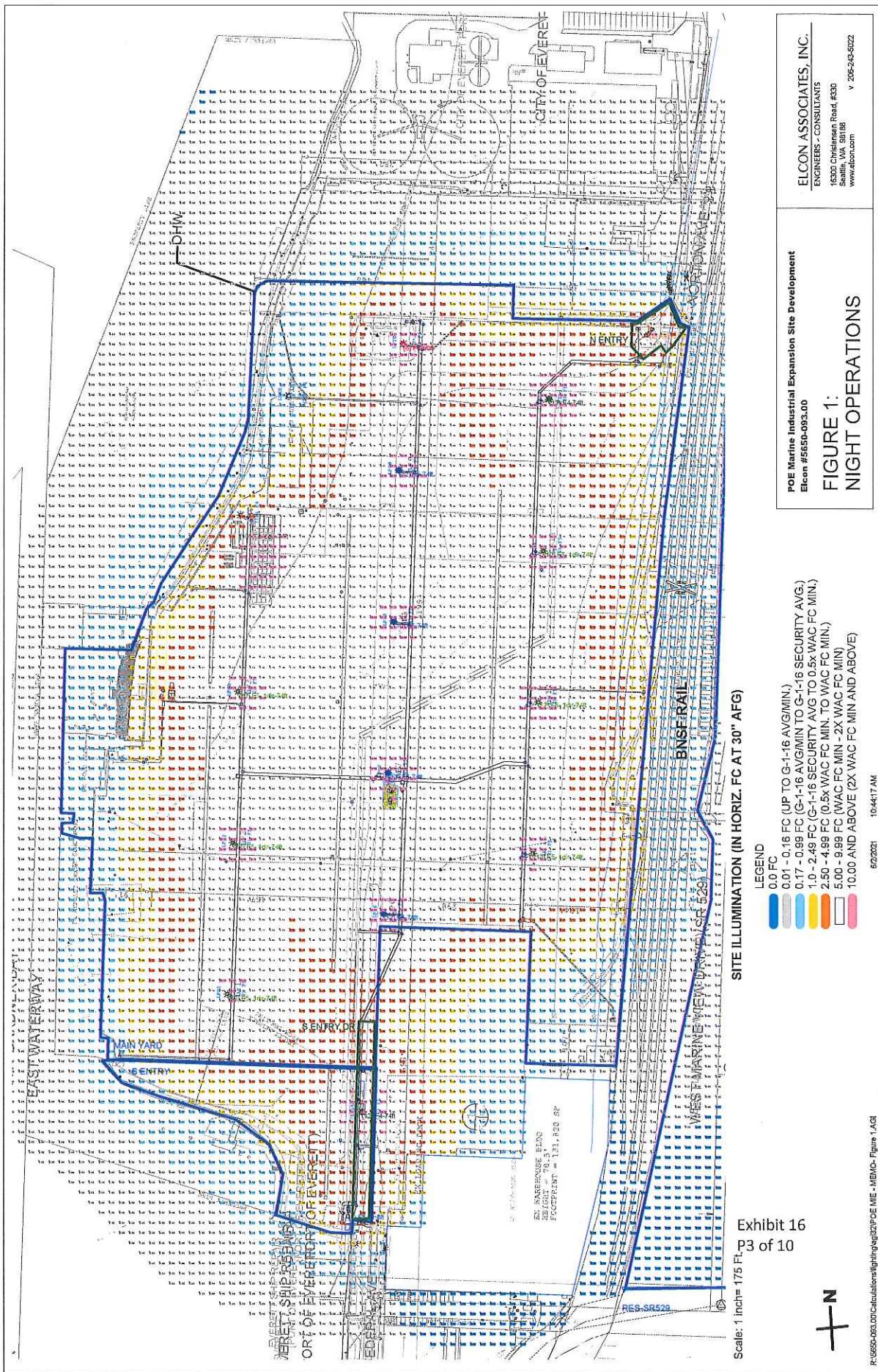
We want to highlight that similar to the Port's existing marine terminal facilities, the proposed **lighting system will operate on various settings**. Traditionally, the majority of the Port's cargo handling

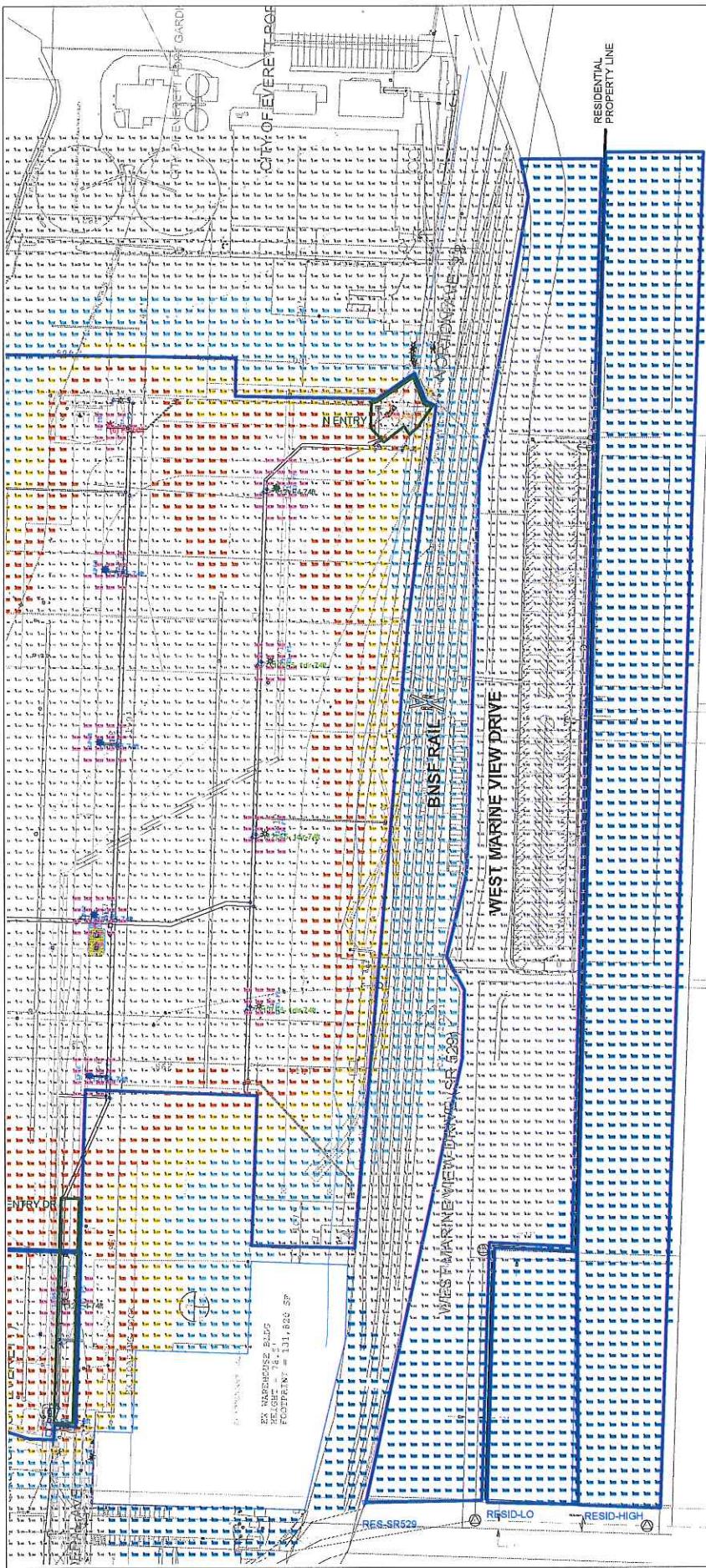
operations occur between approximately 7 am and 5 pm. Full lighting will only be used at night periodically when actual cargo operations are occurring after daylight hours. At all other times when night cargo operations are not occurring, the lights will be set in **security safety mode** where only two of 12 fixtures will be on (see attached **Figure 2** for anticipated site illumination calculations for typical security lighting). This safety light setting is only intended to provide minimal light levels for terminal security and to be sure that the Port's security camera systems can monitor the terminal. As you can see from **Figure 2**, no significant quantity of light spills beyond the terminal boundaries from the typical security lighting.

We have reviewed the City of Everett Municipal Code requirements related to the **Dark-Sky standards** and have had an initial discussion with Dennis Osborn in the City Planning Department. We have talked to three separate lighting manufacturers about their ability to meet the International Dark-Sky Association (IDA) requirements. Only Holophane has fixtures that are included on the IDA "Seal of Approval" list. Manufacturers Phoenix Lighting and Musco have assured us that they can meet the IDA "Seal of Approval" requirements, however, are not officially certified by the IDA. Musco has provided other similar lighting systems in the Everett area including a recent upgrade for the Navy, and highlighted that they are a "Leading Brand Partner" of the IDA.

The Port is a recipient of an \$17.75M **Federal BUILD grant** thru the US Department of Transportation Maritime Administration (MARAD) for this project. The grant agreement mandates competitive bidding requirements, so the Port procurement documents need to allow multiple manufacturers to bid the project (as opposed to using a single manufacturer as a sole source). Since each manufacturer has different lighting fixture designs, the Port plans to write a performance specification to require the lighting levels discussed above, as well as requiring the lighting system to meet IDA requirements. Additionally, the grant mandates "Buy American" requirements for all components used on the project to be manufactured in the United States which further narrows the Port's manufacturer options.

We would be happy to discuss our lighting design in greater detail with you if you have additional questions or comments. Please contact Laura Gurley, Port Planner, to set up a meeting if desired.





Scale: Inch = 175 Ft.

Exhibit 16
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LIGHT SPILL AT RESIDENTIAL (ILLUMINATION IN HORIZ. FC)

Calculation Notes:
Cargo Yard calculated at 2.5 AFG = 20.5 (topo)
Marine Drive and (1) block of residences calculated at 46' (topo)
Residences east of the parking lot calculated at 64' (topo)

LEGEND
0.0 FC
0.01 - 0.16 FC (UP TO G-1-16 AVG/MIN.)
0.17 - 0.99 FC (G-1-16 AVG/MIN TO G-1-16 SECURITY AVG)
1.0 - 2.49 FC (G-1-16 SECURITY AVG TO 0.5X WAC FC MIN.)
2.50 - 4.99 FC (0.5X WAC FC MIN. TO WAC FC MIN.)
5.00 - 9.99 FC (WAC FC MIN -2X WAC FC MIN.)
10.00 AND ABOVE (2X WAC FC MIN AND ABOVE)

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POE Marine Industrial Expansion Site Development
Elcon #5650-093-00

FIGURE 1:
NIGHT OPERATIONS

ELCON ASSOCIATES, INC.
ENGINEERS - CONSULTANTS
16500 Christensen Road, #330
Seattle, WA 98188
v 206-243-5522
www.elcon.com

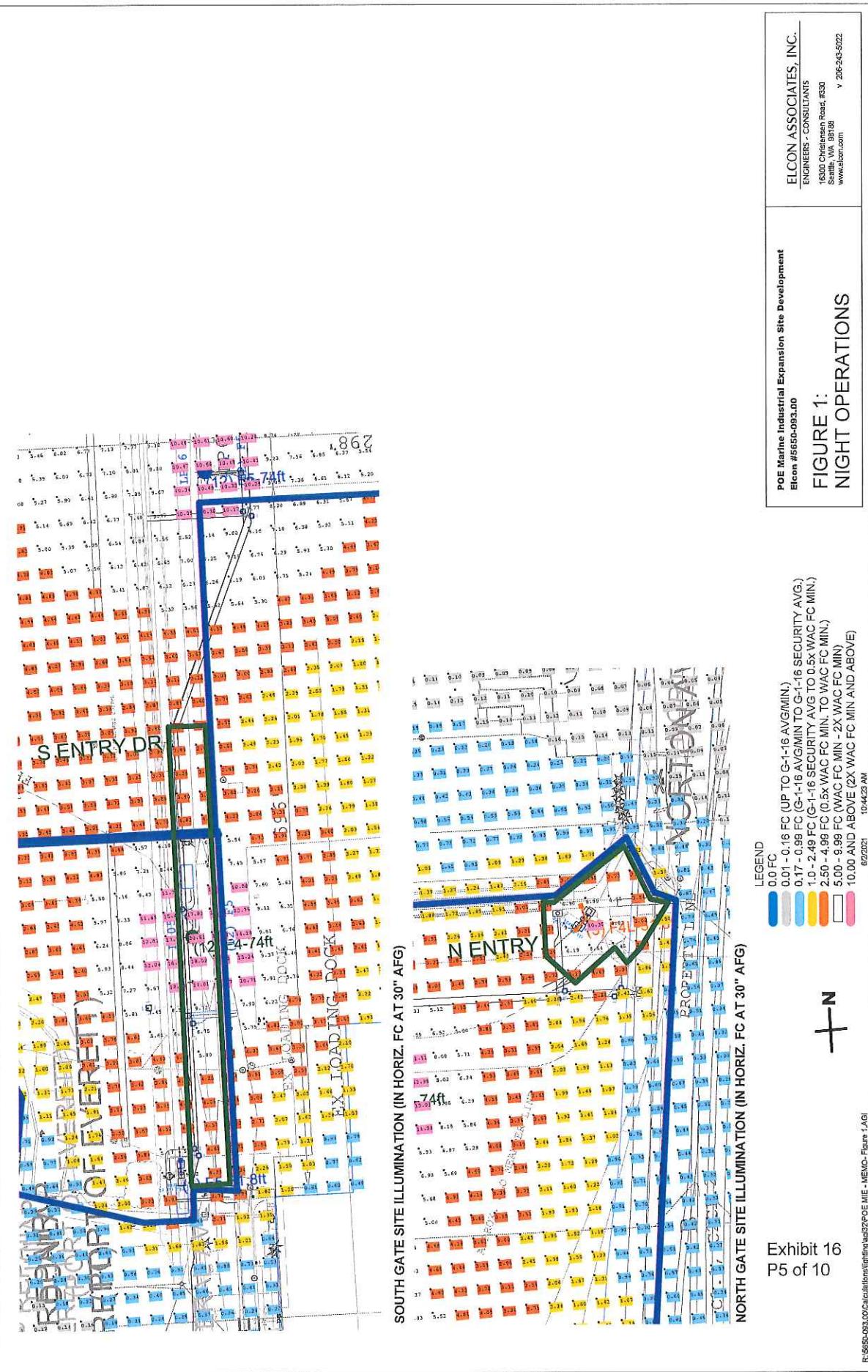


Exhibit 16
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Luminaire Schedule										
Symbol	Ctry	Tag	Description	Arrangement	Arm	Lum. Lumens	LLF	Lum. Watts	Art. Watts	Filename
	1	(3) F4L-31.8ft	Phoenix HL-250-LV-V/GG, 3 heads (radial)	3 @ 120 DEGREES	6	35293	0.684	246.2	744.6	PHOENIX 1042845841A.LX-011A.HL-250-LV-277-4B0-CW.ies
	1	(10) F4-15ft-74ft	Phoenix HL-500-LV-V/GG, 10 heads facing 1 direction	SINGLE	0	35293	1.360	246.2	246.2	PHOENIX 1042845841A.LX-011A.HL-250-LV-277-4B0-CW.ies
	2	(12) F4-74ft	Phoenix HL-500-LV-V/GG, 12 heads (radial)	12 @ 30 DEGREES	2	35293	1.368	246.2	287.4	PHOENIX 1042845841A.LX-011A.HL-250-LV-277-4B0-CW.ies
	4	(12) F5-74ft	Phoenix HL-500-LV-V/GG, 12 heads (radial)	12 @ 30 DEGREES	2	39051	1.368	258.7	3104.4	PHOENIX 1042845841A.LX-010C.MER-250-LX-120-277-CW.ies
	6	(12) F5-15ft-74ft	Phoenix HL-500-LV-V/GG - 12 heads facing 1 direction	SINGLE	0	39051	16.416	258.7	258.7	PHOENIX 1042845841A.LX-010C.MER-250-LX-120-277-CW.ies
	1	(1) F5-31.8ft	Phoenix HL-500-LV-V/GG - 6ft arm	SINGLE	6	39051	1.368	258.7	288.7	PHOENIX 1042845841A.LX-010C.MER-250-LX-120-277-CW.ies
	1	(6) F5-50ft	Phoenix HL-500-LV-V/GG - 6 heads (radial)	6 @ 80 DEGREES	2	39051	1.368	257.7	1552.2	PHOENIX 1042845841A.LX-010C.MER-250-LX-120-277-CW.ies

Calculation Summary										
Label	Description	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min	Max/Min	Max/Min
RES-SP529	RESIDENTIAL AND SR529 SPILL-48 FT	Illuminance	Fc	0.01	0.06	0.00	N.A.	N.A.	N.A.	N.A.
UPSPILL	UPWARD SPILL OVER YARD - 80' AFG	Illuminance	Fc	0.00	0.00	0.00	N.A.	N.A.	N.A.	N.A.
MAIN YARD		Illuminance	Fc	5.06	23.68	0.07	72.29	338.28		
N ENTRY		Illuminance	Fc	5.62	10.35	1.50	3.75	6.90		
RESHIGH	RESIDENTS ON HILL - 64 FT	Illuminance	Fc	0.00	0.00	0.00	N.A.	N.A.	N.A.	N.A.
RES-LO	RESIDENTS ALONG SR529 - 48FT	Illuminance	Fc	0.00	0.01	0.00	N.A.	N.A.	N.A.	N.A.
S ENTRY		Illuminance	Fc	4.05	20.81	0.46	8.80	45.24		
S ENTRY DR	S ENTRY DRIVE	Illuminance	Fc	6.40	20.81	2.60	3.00	7.43		

ILLUMINATION CRITERIA:

IES RP-7-17 INDUSTRIAL FACILITIES

STORAGE YARDS:
5 HFC AVG, 5:1 MAX/MIN

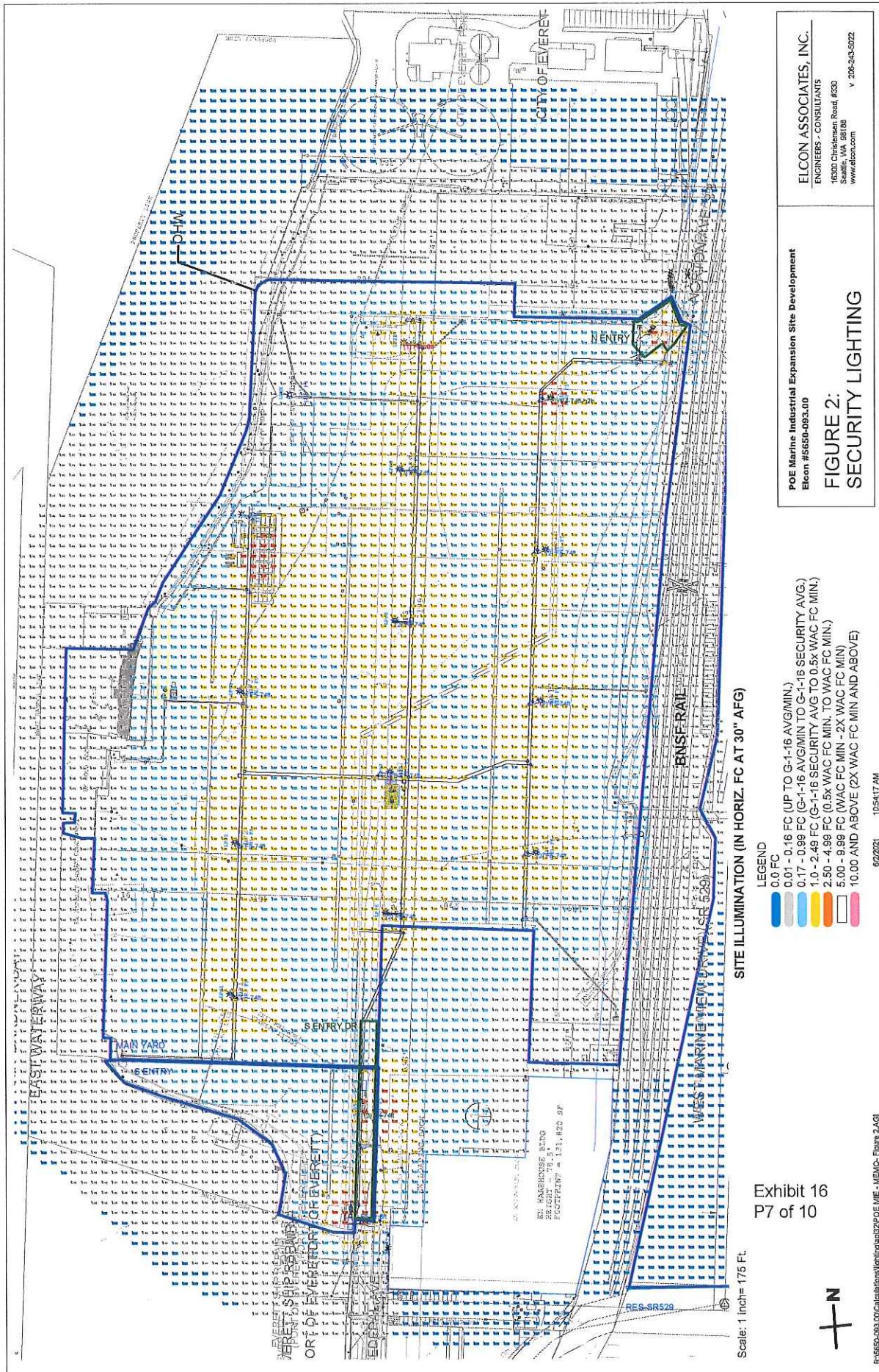
IESNA RECOMMENDATIONS:
IES-G-1-16 SECURITY LIGHTING
STORAGE YARDS AND TERMINALS:
AT LEAST 1.0 HFC AVG MIN, 6:1 AVG/MIN + SURVEILLANCE

CITY OF EVERETT MUNICIPAL CODE, TITLE 19
CHAPTER 19.12.210.D.2.a - All site lighting shall meet dark-sky standards
(0.0 FC/NO UPLIGHT, 3000K)
CHAPTER 19.12.210.D.2.g - Lighting must not trespass onto adjacent
private parcels, nor shall a light source (luminaire) be visible at the property line.
(0.0 FC ON PRIVATE PARCEL)

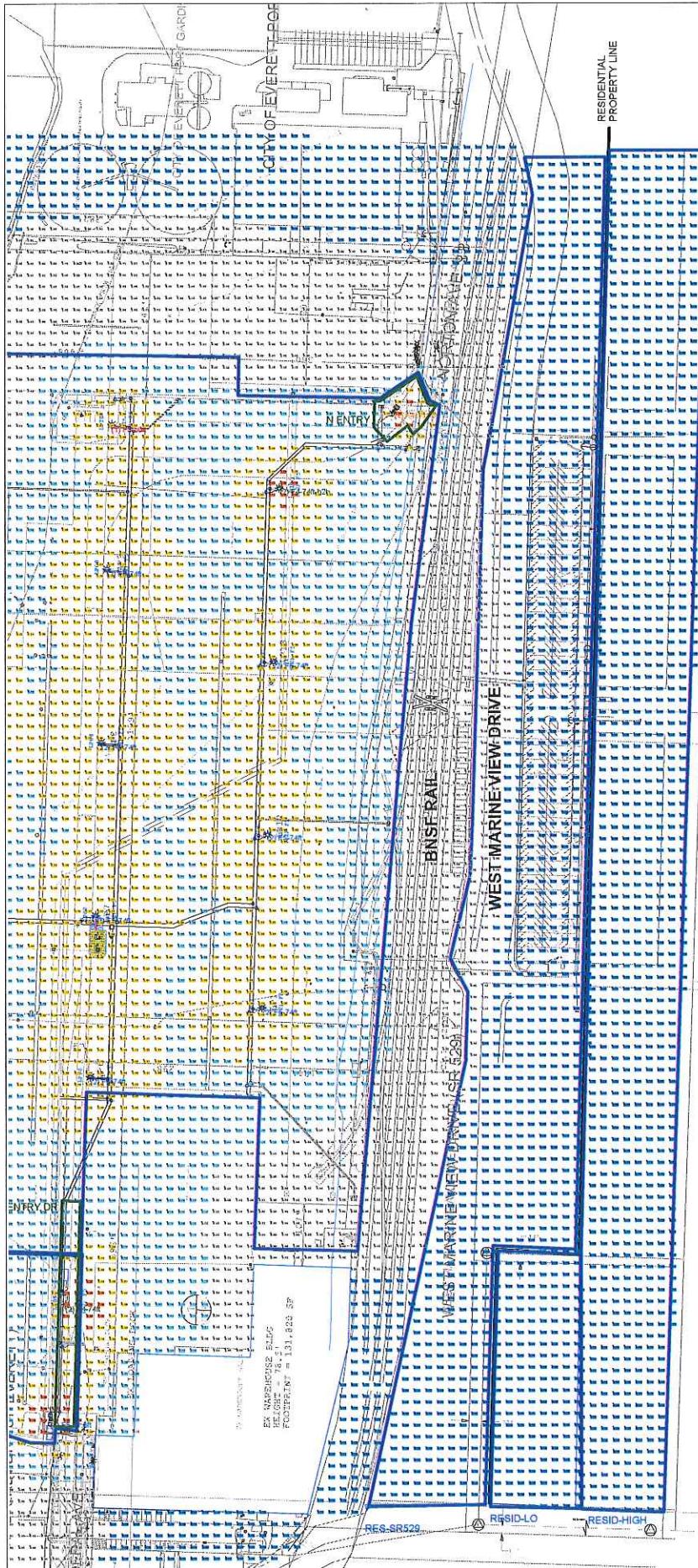
POE Marine Industrial Expansion Site Development
Elcon #6550-093.00

ELCON ASSOCIATES, INC.
ENGINEERS - CONSULTANTS
16200 Christensen Road, #330
Seattle, WA 98188
www.elcon.com
v 206-243-5522

FIGURE 1:
NIGHT OPERATIONS



ELCON ASSOCIATES, INC.
ENGINEERS - CONSULTANTS
15300 Christensen Road, #330
Seattle, WA 98168
www.elcon.com
v 205-245-5722



Scale: 1 inch = 176 Ft
N

LIGHT SPILL AT RESIDENTIAL (ILLUMINATION IN HORIZ. FC)

Exhibit 16
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Calculation Notes:
Cargo Yard calculated at 2.5 AFG = 20.5' (topo)
Marine Drive and (1) block of residences calculated at 46' (topo)
Residences east of the parking lot calculated at 54' (topo)

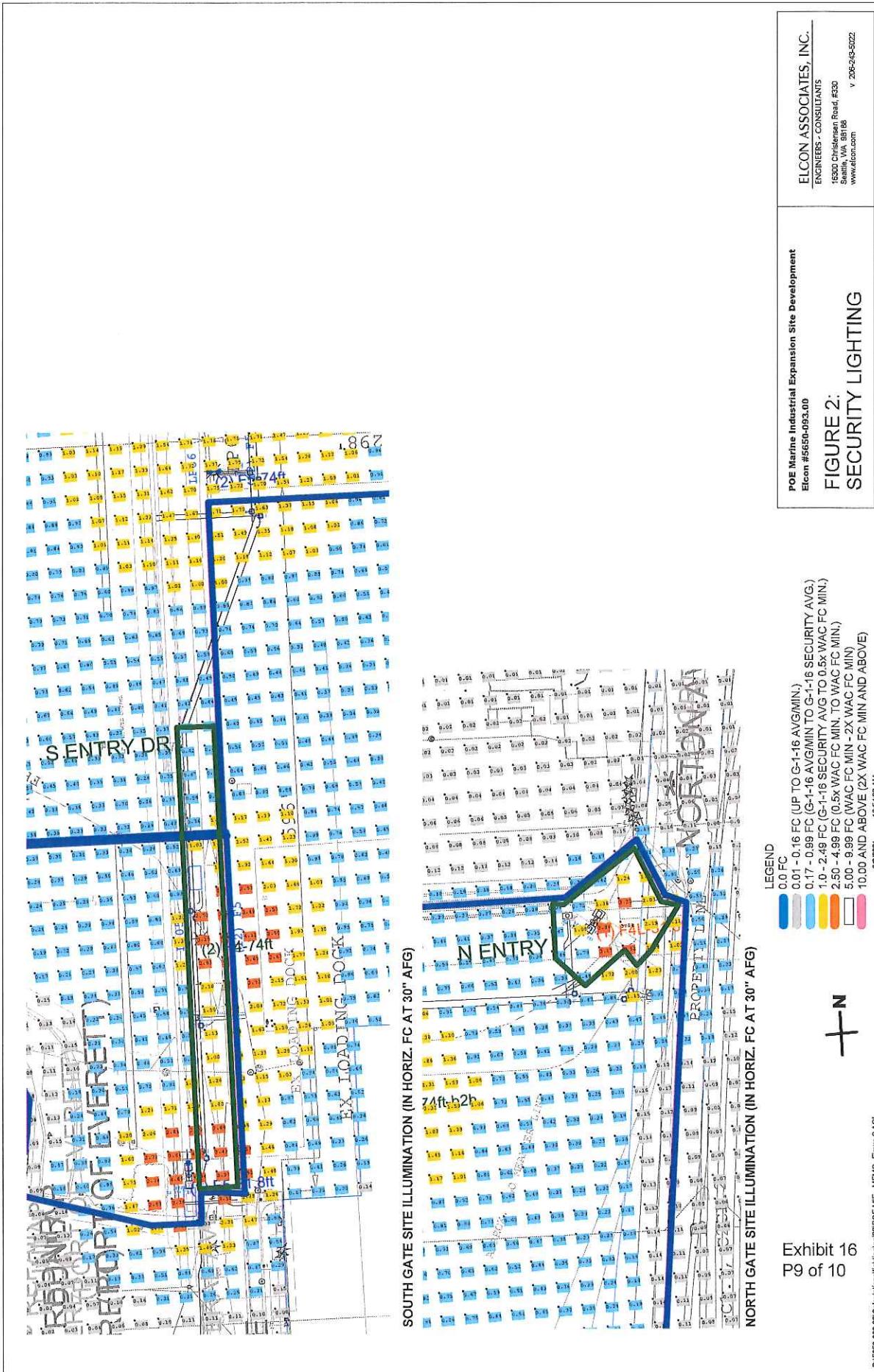
LEGEND

0.0 FC	0.01 - 0.16 FC (UP TO G-1-16 AVG/MIN.)
0.01 - 0.16 FC (G-1-16 AVG/MIN TO G-1-16 SECURITY AVG.)	0.17 - 0.39 FC (G-1-16 SECURITY AVG TO 0.5X WAC FC MIN.)
0.17 - 0.39 FC (G-1-16 SECURITY AVG TO 0.5X WAC FC MIN.)	1.0 - 2.49 FC (0.5X WAC FC MIN TO WAC FC MIN.)
1.0 - 2.49 FC (0.5X WAC FC MIN TO WAC FC MIN.)	2.50 - 4.99 FC (WAC FC MIN - 2X WAC FC MIN)
2.50 - 4.99 FC (WAC FC MIN - 2X WAC FC MIN)	5.00 - 9.99 FC (WAC FC MIN AND ABOVE (2X WAC FC MIN AND ABOVE))
5.00 - 9.99 FC (WAC FC MIN AND ABOVE (2X WAC FC MIN AND ABOVE))	10.00 AND ABOVE (2X WAC FC MIN AND ABOVE))

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POE Marine Industrial Expansion Site Development
Elcon #5650-093.00
FIGURE 2:
SECURITY LIGHTING

ELCON ASSOCIATES, INC.
ENGINEERS - CONSULTANTS
16200 Christensen Road, #330
Seattle, WA 98188
www.elcon.com
v 205-243-5022



Luminaires Schedule			
Symbol	Qty	Tag	Description
	1	(1) F4 -31.8ft	Phoenix HL-250V-LV-GG
	2	(2) F4 -4ft	Phoenix HL-500 4-V-GG, 2 heads facing 1 direction
	1	(2) F4 -24ft-b2b	Phoenix HL-500-LX-GG, 6ft arm
	1	(1) F5 -30ft	Phoenix HL-500 4-X-GG, 6 heads (radial)
	10	(2) F5 -74ft	Phoenix HL-500-LX-GG, 2ft arm, 2 heads (back-to-back)

Label	Description	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
RES-SR29	RESIDENTIAL AND SR29 SPILL-48 FT	Illuminance	Fc	0.00	0.01	0.00	N.A.	N.A.
UPSPILL	UPWARD SPILL OVER YARD - 80 AFG	Illuminance	Fc	0.00	0.00	0.00	N.A.	N.A.
MAIN YARD		Illuminance	Fc	0.46	5.64	0.01	86.00	584.00
N ENTRY		Illuminance	Fc	2.09	5.84	0.49	4.27	11.92
RESIDENTS ON HILL - 64 FT		Illuminance	Fc	0.00	0.00	0.00	N.A.	N.A.
RES-HIGH	RESIDENTS ALONG SR529 - 48FT	Illuminance	Fc	0.00	0.00	0.00	N.A.	N.A.
RES-LD		Illuminance	Fc	0.79	4.94	0.03	26.33	164.87
S ENTRY		Illuminance	Fc	1.93	4.63	0.42	4.60	11.02
S ENTRY DR		Illuminance	Fc					

ILLUMINATION CRITERIA:

IES RP-7-17 INDUSTRIAL FACILITIES STORAGE YARDS: 5 HFC AVG, 5:1 MAX:MIN	
IESNA RECOMMENDATIONS: IES-G1-16 SECURITY LIGHTING STORAGE YARDS AND TERMINALS: AT LEAST 1.0 HFC AVG MIN. 8:1 AVG:MIN + SURVEILLANCE	
CITY OF EVERETT MUNICIPAL CODE, TITLE 19 CHAPTER 19.12.210.D.2.a - All site lighting shall meet dark-sky standards (0.0 FC NO UPLIGHT, 3000K)	
CHAPTER 19.12.210.D.2.g - Lighting must not trespass onto adjacent private parcels, nor shall a light source (luminaire) be visible at the property line. (0.0 FC ON PRIVATE PARCEL)	

Exhibit 16
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POE Marine Industrial Expansion Site Development Elcon #5150-093.00	ELCON ASSOCIATES, INC. ENGINEERS - CONSULTANTS 1530 Christensen Road, #330 Seattle, WA 98188 www.elcon.com
FIGURE 2: SECURITY LIGHTING	v 206-245-5022